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Modified surgical template with dual function: a technical report

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ABSTRACT

A modified surgical template to guide the positioning of an implant immediately after tooth extraction and secure the immediate placement of an interim crown is described.

INTRODUCTION

The placement of dental implants immediately after tooth extraction is a popular treatment option, which has been reported to have high success rates.[1-4] This technique has enabled clinicians to shorten treatment time and possibly provide an interim crown at the time of implant placement. In addition to shortening the surgical procedures, the immediate placement and provisional restoration of a dental implant is purported to better preserve the gingival and bone architecture, resulting in greater comfort and patient acceptance.[2,4,5]

However, successful immediate implant placement depends on satisfactory patient selection, treatment planning, and atraumatic tooth extraction. This enables adequate primary stability and correct implant location in a site that has preserved the natural architecture of soft and hard tissues. For this purpose, surgical guides have been used to ensure the correct 3-dimensional (3-D) positioning of the implant.[6,7]

After immediate implant placement, an interim crown can provide patients with rewarding and rapid esthetic results. When an interim crown can be made by copying the

emergence profile of a correctly located but hopeless tooth, it facilitates the maintenance of the postextraction gingival architecture, minimizing possible damage to hard and soft tissues after tooth extraction. However, it is important to ensure that the interim crown does not contact the opposing dentition in maximal intercuspation or during excursive mandibular movements.[9,10] In this article, a surgical guide that can correctly guide implant placement as well as the correct placement of an interim crown is described.

TECHNIQUE

1. Make stone casts of the maxillary and mandibular arches. Remove the tooth to be extracted from the cast and make an interim crown from heat-polymerized polymethyl methacrylate (New Outline; AnaxDent GmbH, Stuttgart, Germany).

2. Fabricate a clear plastic template in 2-mm thick, clear, soft ethylene vinyl acetate (Pro-Form; Dental Resources Inc, Delano, Minn) on the cast with the interim crown (Fig 1). Cut the acetate sheet following the buccal gingival contour. Keep the guide open on the palatal side around the crown to enable surgical access.

3. Extract the tooth by using an atraumatic technique (Benex - Control Root Extraction System; Meisinger, Düsseldorf, Germany) (Fig 2). After extraction, place the surgical guide to direct the positioning of the implant. The open palatal side of the guide will enable surgical access, and the buccal outline will assist proper 3-D implant positioning (Fig 3).

4. After implant placement (Flash 3.5 × 13mm; Conexão, São Paulo, Brazil), attach the corresponding provisional abutment to the implant to fabricate the interim crown. Evaluate whether adequate occlusal space exists for the crown and the abutment. If not, unscrew the component (Abutment 166211; Conexão) and shorten it outside the mouth. Condense a small

piece (approximately 5 mm) of polytetrafluoroethylene tape (PTFE; New Age Industries Inc, Willow Grove, Pa) in the screw hole to prevent acrylic resin from sticking to the head of the screw.

5. Place the interim crown in the previously fabricated surgical guide. With a brush-bead technique (Figs 4 and 5), fill the crown with colored autopolymerizing acrylic resin (Duralay; Reliance, Dental MFG Co., Worth, Ill). Position the assembly intraorally. Keep the surgical guide in place until the acrylic resin polymerizes. Then, remove the acetate guide, access the abutment screw with a round diamond rotary instrument (Komet, Rock Hill, SC), remove the crown and create the appropriate emergence profile with acrylic resin (Duralay; Reliance, Dental MFG. Co.).

6. Replace the crown to verify whether the gingival architecture is preserved. In the event of excessive pressure, reduce the emergence profile. Finish and polish (Acrylic Polisher; Komet) the crown, especially in the transmucosal area (Fig 6).

SUMMARY

This technique allows the clinician to use a single surgical guide to correctly place an implant in a postextraction site and position an interim crown that restores optimal esthetics.

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LEGENDS

Fig. 1. Acetate sheet on cast with interim crown.

Fig. 2. Atraumatic tooth removal.

Fig. 3. Surgery assisted with guide.

Fig. 4. With brush-bead technique interim crown is filled with autopolymerizing acrylic resin.

Fig. 5. Guide and interim crown intraorally.

Fig. 6. Result after placement of interim crown.